

## 6. ACADEMIC ACTIVITIES

### 6.1 PELLETRON BEAM UTILIZATION BY USERS

#### 6.1.1 PELLETRON BEAM TIME UTILIZATION AND EXPERIMENTS PERFORMED (APRIL, 2011 TO MARCH, 2012)

Users	No. of Shift allotted	Nuclear Physics	Materials Science	Project in Radiation Biology	Atomic Physics	AMS
<b>A. Universities/Colleges</b>						
Rajasthan University	2		1			
Guru Nanak Dev University (GNDU), Amritsar	7		3			
Panjab University, Chandigarh	78	3				
Tezpur University	8		4			
Utkal University	4		1			
Allahabad University	4		2			
Tumkur University	3		1			
Babasaheb Ambedkar Marathwada University, Aurangabad	6		3			
Kongunadu Arts and Science College, Coimbatore	5		2			
Banaras Hindu University (BHU), Varanasi	10		4			
Bangalore University	3		1			
DAV College, Kanpur	2		1			
Mysore University	3		1			
Padova University	3		1			
Bharathidasan University	2		1			
MMH College, Ghaziabad	7		2	1		
Calicut University	15	1				
Delhi University	24	1				
Kalyani University	2			1		
West Bengal University of Technology (WBUT), Kolkata	1			1		
Cochin University of Science and Technology, Cochin	2		1			
University and Petroleum & Energy Studies, Dehradun	4		1			
Aligarh Muslim University (AMU)	17	1	1			
Bharathiar University	3		1			
SV College, Aligarh	2		1			

Users	No. of Shift allotted	Nuclear Physics	Materials Science	Project in Radiation Biology	Atomic Physics	AMS
Guru Gobind Singh Indraprastha University, Delhi	3		1			
Japan	4		1			
Manav Rachna International University, Faridabad	6		1			
G.B. Pant University of Ag. & Technology, Pantnagar	3		1			
Anna University	7		3			
Manipur University	2		1			
Hyderabad University	4		1			
Maharaja Sayajirao University (MSU), Baroda	2		1			
Bareilly College	2		1			
<b>B. Institutions</b>						
Indian Institute of Technology (IIT), Delhi	12		4			
Indian Institute of Technology (IIT), Roorkee	4		2			
Indian Institute of Technology (IIT), Kharagpur	2		1			
Indian Institute of Technology (IIT), Chennai	3		1			
National Institute of Technology (NIT), Kurukshetra	4		2			
National Institute of Technology (NIT), Rourkela	3		1			
National Institute of Technology (NIT), Tiruchirappalli	2		1			
Inter-University Accelerator Centre (IUAC)	109	3	9	2	1	
Indian Space Research Organisation (ISRO), Bangalore	23		2			
Tata Institute of Fundamental Research (TIFR), Mumbai	30	1				
Saha Institute of Nuclear Physics (SINP), Kolkata	12	1				
Bhabha Atomic Research Centre (BARC), Mumabi	15	1				
National Institute of Science Education and Research (NISER), Orissa	4		1			
Physical Research Laboratory (PRL), Ahmedabad	12	1				
Indian School of Mines, Dhanbad	5		1			
Maulana Azad National Institute of Technology, Bhopal	3		1			
NIO, Goa	3				1	
CSNSM-IN2P3, France	2		1			
UGC-DAE-CSR, Indore	3		1			
C. Facility Tests	4					
Total 505	13	72	5	1		

Beam time was also used for LINAC Group, IUAC.

### 6.1.2 LIST OF USERS FAMILY

The following list includes Universities/Colleges/Institutions that have used the IUAC Pelletron facility (once or more) since 1991.

#### (A) UNIVERSITIES - (87)

01.	Acharya Nagarjuna University	Andhra Pradesh
02.	Agra University (B.R. Ambedkar Univ.)	Agra
03.	Aligarh Muslim University	Aligarh
04.	Allahabad University	Allahabad
05.	Andhra University	Waltair
06.	Anna University	Chennai
07.	Assam University	Silchar
08.	Banaras Hindu University	Varanasi
09.	Bangalore University	Bangalore
10.	Berhampur University	Berhampur
11.	Bhagalpur University	Bhagalpur
12.	Bharathiar University	Coimbatore
13.	Bharthidasan University	Tirucherapalli
14.	Bhavnagar University	Bhavnagar
15.	Bombay University	Mumbai
16.	Burdwan University	Burdwan
17.	Calcutta University	Kolkata
18.	Calicut University	Calicut
19.	Chaudhury Charan Singh University	Meerut
20.	Cochin University	Cochin
21.	Cochin University of Science & Technology	Cochin
22.	Delhi University	Delhi
23.	Devi Ahilya University	Indore
24.	Dr. B.A.M. University	Aurangabad
25.	G.B. Pant University	Pantnagar
26.	Gauhati University	Guwahati

27.	Gujarat University	Ahmedabad
28.	Gulbarga University	Gulbarga
29.	Guru Ghasidas University	Bilaspur
30.	Guru Nanak Dev University	Amritsar
31.	Himachal Pradesh University	Simla
32.	H.N.B. Garhwal University	Srinagar Garhwal
33.	Hyderabad University	Hyderabad
34.	Indra Prastha University (GGSIPU)	New Delhi
35.	Indira Gandhi National Open University (IGNOU)	New Delhi
36.	Jamia Milia Islamia University	New Delhi
37.	Jammu University	Jammu
38.	Jawaharlal Nehru University	New Delhi
39.	Kalyani University	Kalyani
40.	Karnataka University	Dharwad
41.	Kashmir University	Srinagar
42.	Kiel University	Germany
43.	Kurukshetra University	Kurukshetra
44.	Kuvempu University	Shankaraghatta, Shimoga
45.	Lucknow University	Lucknow
46.	Ludwig Maximillian University	Munich, Germany
47.	M.D. University	Rohtak
48.	M.L. Sukhadia University	Udaipur
49.	M.S. University	Baroda
50.	Madras University	Chennai
51.	Mahatama Gandhi University	Kottayam
52.	Manav Rachna International University	Faridabad
53.	Mangalore University	Mangalore
54.	Manipur University	Imphal
55.	Mannonmaniam Sundarnar University	Tirunelveli
56.	M.M. University	Ambala
57.	Mysore University	Mysore

58.	Nagpur University	Nagpur
59.	North Carolina State University	USA
60.	North Eastern Hill University	Shillong
61.	North Maharashtra University	Jalgaon
62.	North Orissa University	Baripada
63.	Osmania University	Hyderabad
64.	Patna University	Patna
65.	Periyar University	Kerala
66.	Pondichery University	Pondichery
67.	Poona University	Pune
68.	Punjab Agricultural University	Ludhiana
69.	Punjab University	Chandigarh
70.	Punjabi University	Patiala
71.	Rani Durgawati University	Jabalpur
72.	S.K. University	Anantpur
73.	Stuttgart University	Germany
74.	Saurashtra University	Rajkot
75.	Technical University	Darmstadt, Germany
76.	Tezpur University	Tezpur
77.	Tumkur University	Tumkur
78.	Shivaji University	Kolhapur
79.	University and Petroleum & Energy Studies	Dehradun
80.	University of Maryland	Maryland, USA
81.	University of Notre Dame	Notre Dame, USA
82.	University of Padova	Italy
83.	University of Rajasthan	Jaipur
84.	Utkal University	Bhubaneswar
85.	Vikram University	Ujjain
86.	Vishwa Bharti University	Bolpur
87.	West Bengal University of Technology	Kolkata

**(B) COLLEGES - (54)**

01.	Anand Mohan College	Kolkata
02.	Armed Forces Medical College	Pune
03.	Bareilly College	Bareilly
04.	Belonia College	Belonia, Tripura
05.	Beant College of Eng. And Technology	Gurdaspur
06.	Bharatiya Jain Sanghatana College	Pune
07.	Bhiwandi College	Mumbai
08.	B.N.N. College	Bhivandi, Madhya Pradesh
09.	C.H.M. College	Ulhasnagar, Maharashtra
10.	College of Engineering and Technology	Aligarh
11.	D.A.V. College	Mumbai
12.	D.A.V. College	Jalandhar
13.	D.A.V. College	Kanpur
14.	D.B.S. College	Dehradun
15.	Doodhsakhar Mahavidyalaya	Bidri, Maharashtra
16.	Ewing Christian College	Allahabad
17.	Govt. Art College	Rajamundri, Andhra Pradesh
18.	Govt. College	Ajmer
19.	Govt. College	Mehendragarh
20.	Govt. College	Kota
21.	Govt. M.S.J. College	Bharatpur
22.	Goyalpara College	Goyalpara, Assam
23.	Gurudas College	Kolkata
24.	Jai Hind College	Mumbai
25.	Kandi Raj College	Murshidabad, (WB)
26.	Kongunadu Arts & Science College	Coimbatore
27.	Koshi College	Khagaria, Bihar
28.	Mahila Degree College	Lucknow
29.	Marwari College	Ranchi
30.	M.M.H.College	Ghaziabad

31.	M.R. College	Vizianagram (AP)
32.	Malviya Regional Engg. College	Jaipur
33.	Nayagarh College	Nayagarh
34.	Nizam College	Hyderabad
35.	NSAM College	Mangalore
36.	Orissa Univ. of Agriculture & Tech.	Bhubneshwar
37.	Poorna Prajna College	Udipi, Karnataka
38.	Punjab Engineering College	Chandigarh
39.	R.B.S. College	Agra
40.	RD & DJ College	Munger, Bihar
41.	Regional Engineering College	Kurukshetra
42.	R.P.G. College	Ratnagiri
43.	School of Physical Sciences	Nanded, Maharashtra
44.	School of Tech. & Applied Sciences	Kottayam, Kerala
45.	SDM College	Ujire, Mysore
46.	Sharanabasaveshwar College of Science	Gulbarga
47.	S.N.College	Kollam
48.	Sri Bhuvanendra College	Karkala
49.	St. Edmunds College	Shillong
50.	S.V. College	Aligarh
51.	Swami Shardhanand College	New Delhi
52.	University College	Kurukshetra
53.	University College of Science & Tech.	Kolkata
54.	Vaish College	Rohtak

**(C) OTHER INSTITUTIONS - (64)**

01.	AICTE	New Delhi
02.	AIIMS	New Delhi
03.	Amity School of Engineering	New Delhi
04.	Bhabha Atomic Research Centre	Mumbai
05.	C.E.E.R.I.	Pilani

06.	CAT	Indore
07.	CCMB	Hyderabad
08.	Centre for Superconductivity research	USA
09.	CSNSM, Orsay Cedex	France
10.	D.M.R.L.	Hyderabad
11.	Dayalbagh Educational Institute	Agra
12.	Defence Laboratory	Jodhpur
13.	Defence Research & Development Orgn.	Dehradun
14.	Genetic Institute of Manufacturing Technology	Singapore
15.	GSI	Germany
16.	Harcourt Butler Technological Institute	Kanpur
17.	ICGEB	New Delhi
18.	IISER	Kolkata
19.	I.G.C.A.R.	Kalpakkam
20.	Indian Institute of Science	Bangalore
21.	Indian Institute of Technology	Chennai
22.	Indian Institute of Technology	Kanpur
23.	Indian Institute of Technology	Kharagpur
24.	Indian Institute of Technology	Mumbai
25.	Indian Institute of Technology	New Delhi
26.	Indian Institute of Technology	Roorkee
27.	Indian School of Mines	Dhanbad
28.	Indian Space Research Organisation	Bangalore
29.	INFN-LEGNARO	Italy
30.	INMAS	New Delhi
31.	Institute of Basic Sciences	Agra
32.	Institute of Materials Science	Bhubaneswar
33.	Institute of Physics	Bhubaneswar
34.	Institute of Science	Mumbai
35.	IUC-DAEF, Calcutta Centre	Kolkata
36.	IUC-DAEF, Indore Centre	Indore



37.	Joint Inst. of Nuclear Research	Dubna, Russia
38.	KIIT	Bhubaneswar
39.	Massachusetts Inst. of Technology	USA
40.	Malaviya National Institute of Technology	Jaipur
41.	Maulana Azad National Inst. of Technology (MANIT)	Bhopal
42.	Nanocrystals Technology	USA
43.	National Institute of Materials Science	Japan
44.	National Academy of Science	Allahabad
45.	National Institute of Oceanography	Goa
46.	National Institute of Technology	Kurukshetra
47.	National Institute of Technology	Raurkela
48.	National Institute of Technology	Silchar
49.	National Institute of Technology	Srinagar
50.	National Institute of Technology	Tiruchirapalli
51.	National Physical Laboratory	New Delhi
52.	NCCCM/BARC	Hyderabad
53.	NCAOR	Goa
54.	NCSR	France
55.	NISER	Bhubaneswar
56.	Oak Ridge National Laboratory	USA
57.	Physical Research Laboratory	Ahmedabad
58.	Saha Institute of Nuclear Physics	Kolkata
59.	Sant Longowal Institute of Technology	Sangrur
60.	SSPL	New Delhi
61.	Tata Institute of Fundamental Research	Mumbai
62.	Thapar Inst. Of Eng. & Technology	Patiala
63.	VECC	Kolkata
64.	Wadia Institute of Himalayan Geology	Dehradun

## **6.2 STUDENTS' PROGRAMME**

### **6.2.1 B.SC. SUMMER PROGRAMME**

A. Mandal

To encourage meritorious students for studying Basic Science, we have started a Summer project programme for B.Sc. Physics students. Advertisement for this programme is given in web-site [www.iuac.res.in](http://www.iuac.res.in). About 20 students all over India are selected for doing projects under supervision of IUAC scientists for a month during June-July. They are provided travel allowance and free boarding and lodging.

### **6.2.2 M.SC. ORIENTATION PROGRAMME**

R Mehta

Inter-University Accelerator Centre (IUAC) conducts M. Sc. Orientation Programme to encourage interested students to supplement their knowledge and to motivate them to continue their career in science. This programme has been envisaged to provide hands-on training in fields associated with accelerator / ion beam based research to selected M. Sc. students by way of short projects. However, this programme is not conducted to satisfy the M. Sc. credit requirements of any University / Department. Due to large number of applications received every year, we may not be able to select all for the project work. In order to provide opportunity for students from various universities, students from the same universities may be given less priority for consideration in successive years.

The duration of M. Sc. Orientation programme has been increased to three weeks. It is open throughout the year. Student can apply for this programme based on their convenient time. This flexibility allows the students to choose the project period without hampering their main study course. We try to plan the project period as desired by the student but in case we are unable to do so we suggest suitable dates of the project.

Details of this programme can be accessed at: <http://www.iuac.res.in/events/msco.htm>

### **6.2.3 THE PHD TEACHING PROGRAMME**

A. Mandal

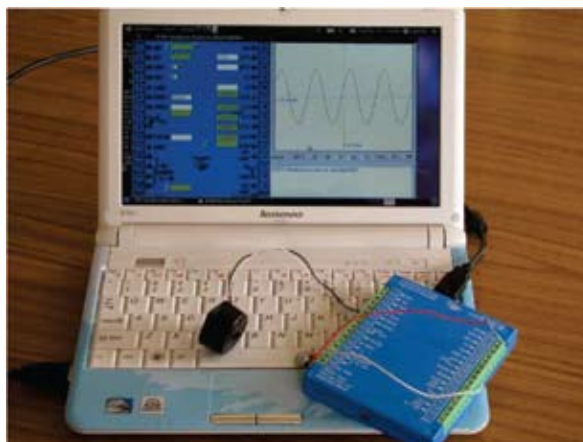
The two semester Ph.D programme for research students of IUAC, other universities in India and for new scientist trainees of IUAC continued to run well during this year. Overwhelming response from different universities shows the positive benefit of the programme to the community of students starting fresh research at different universities throughout the country. The programme consists of two semesters - one during January-May in which courses on Experimental Physics and Accelerator Physics are offered and the second one during August-December in which courses on Computers in instrumentation and data acquisition and Advanced course on Material sciences were offered. Each course consists of five modules. Each module consists of 8 lectures of one and half hour duration and the credit awarded is 1.0. One course on Engineering Drawing is also offered as a part of the Experimental Physics to give basic understanding of drawing. About 20 students from different universities, colleges participated in each module. Several students from School of Physical sciences, JNU attended the course on Experimental Physics.

Some special lecture series on Nuclear Physics, Basic Atomic Physics and Quantum Mechanics by eminent professors in the respective field were also offered this year. A large number of students attended these special lecture series and they appreciated the subject contents and teaching.

One month before each semester a poster containing details of the course is printed and circulated to physics department of various universities and colleges inviting application for attending to the courses. The programme is also put into our website. Accommodation and TA/DA are provided to the selected participants.

### 6.2.4 TEACHING LAB ACTIVITIES

A new device, name expEYES, has been developed to support teaching experimental science. It is a portable, expandable and affordable science laboratory, supporting a wide range of experiments from high school to post graduate level. It combines the power available under Python for doing scientific computation and data visualization, with control a data acquisition hardware device that can communicate to Python over the USB port. Mathematical analysis of experimental data and the GUI are done using modules like Scipy, Matplotlib and Tkinter. GUI programs are available for around fifty experiments that are documented in a user manual. The programmer's manual helps in developing new experiments



using the Python library. ExpEYES has a resolution of 0.1% for analog signals and one microsecond for time interval measurements. It can change the way in which science and engineering is taught and encourages the concept of learn by exploring. For more details visit <http://expeyes.in>

## 6.3 LIBRARY

Priyambada Nayak

Salient features

Working hours:	Round the clock, all days of the week
Total Books:	~2786(broadly covering the subjects Nuclear Physics, Materials Science, Nanotechnology, Electronics, Computer Science, Radiobiology, Radiation Physics, Vacuum Instrumentation, Cryogenics, Atomic Physics, Mathematical Physics, Quantum Mechanics, Astrophysics etc.
New Books added in 2011-12:	40
Current Journals:	52
Journal Archives:	7
Bound Journals:	~8500
Laboratory Reports:	~900 (from nearly 50 labs)
Newsletters, House magazines etc.	50
Databooks, Manuals etc.:	~550
Ph.D. Thesis:	135

Clientele: Apart from IUAC staff and students, the library is consulted by students, teaching and research staff from over 100 academic and research institutions in different parts of the country.

The technical reports and technicals memos of various projects carried out at IUAC are also compiled and kept in the library for reference purpose. Web-based OPAC and library cataloging software package has been installed for the computerization of library documents. Apart from the print journals, online journals & archives are also being subscribed by the library. The library is a member of UGC-INFONET, INDEST-AICTE Consortium and more than 4000 journals are being accessed on-line through these facilities. The library is open round the clock. Hence, automatic monitoring system has been installed.

#### 6.4 ACADEMIC ACTIVITIES HELD IN 2011-12

- |                 |   |
|-----------------|---|
| April 14-15     | Meeting on <b>Mass Spectrometry in Health &amp; Environmental Sciences</b><br>(Contact Person: S. Chopra, IUAC) |
| April 20-21     | Workshop on <b>High Performance Computing</b><br>(Contact Person: S. Mookherjee, IUAC)                          |
| May 2-7         | Workshop on <b>Innovative experiments</b><br>(Contact Person: B.P. Ajith Kumar & K. Asokan, IUAC)               |
| May 16          | <b>Summer Programme</b> for B.Sc (Physics) Students<br>(Contact Person: A. Mandal, IUAC)                        |
| June 14         | <b>Acquaintance Programme</b> at Simla<br>(Contact Person: Fouran Singh, IUAC)                                  |
| July 6-7        | <b>User Workshop:</b> Accelerator users' presentations for beam time proposals                                  |
| July 8          | <b>50th AUC Meeting</b>   |
| August 8        | Ph.D programme, <b>Fall semester starts</b><br>(Contact Person: A. Mandal, IUAC)                                |
| September 12    | Workshop on <b>AMS</b><br>(Contact Person: S. Chopra & Pankaj Kumar, IUAC)                                      |
| September 16    | <b>Acquaintance Programme at Baripada</b><br>(Contact Person: D. Kabiraj, IUAC)                                 |
| September 20-22 | <b>IUAC Academic Workshop</b>   |
| October 10-15   | Workshop on <b>Innovative experiments</b><br>(Contact Person: B.P. Ajith Kumar & K. Asokan, IUAC)               |

October 17-19	<b>Workshop on Nanostructuring by energetic ions</b> (Contact Person: D.K. Avasthi, IUAC)
October 21-22	<b>Workshop on Atomic &amp; Molecular Physics and Materials science using LEIBF</b> (Contact Person: Pravin Kumar, IUAC)
November 14	<b>Acquaintance Programme at Nagpur</b> (Contact Person: Saif A. Khan, IUAC)
November 16-18	<b>Asian Conference on Applied Superconductivity &amp; Cryogenic (ACASC 2011)</b> (Contact Person: T.S. Datta, IUAC)
November 21-25	<b>School on Radiation Biology</b> (Contact Person: A. Sarma, IUAC)
December 17-18	<b>User Workshop:</b> Accelerator users' presentations for beam time proposals
December 19	<b>Foundation Day &amp; 51st AUC meeting</b>
January 24	<b>Ph.D Programme: Spring semester starts</b> (Contact Person: A. Mandal, IUAC)
February 28	<b>National Science Day</b> (Contact Person: Saif A. Khan)
March 5-7	<b>Frontiers in Gamma Spectroscopy</b> (Contact Person: S. Muralithar)
March 19-20	<b>IUAC Academic Workshop</b>
March 23	<b>Acquaintance Programme at Bareilly</b> (Contact Person: A. Tripathi)

## **6.5 FORTHCOMING EVENTS: 2012**

April 10-14	<b>School cum Workshop on Parallel Computing for Scientific Applications</b> (Contact Person: S. Mookherjee)
May 30-5	<b>Workshop on Innovative Experiments</b> (Contact Person: Ajith Kumar B.P./V.V. Satyanarayan, IUAC)
June 14	<b>Acquaintance Programme at Mata Vaishno Devi Univ., Jammu</b> (Contact Person: Fouran Singh)

June 15	<b>Summer Programme for B.Sc Physics students</b> (Contact Person: A. Mandal)
July 6-7	<b>Users Workshop</b>
July 8	<b>52nd AUC Meeting</b>
August 8	<b>Ph.D Programme</b> , Fall semester starts (Contact Person: A. Mandal)
August 9-10	Workshop on <b>Accelerator based Atomic Physics</b> (Contact Person: T.K. Nandi)
August 22-24	<b>IUAC Academic Workshop</b>
September 12	<b>Discussion Meeting on LEIBF</b> (Contact Person: Pravin Kumar)
21 September	<b>Acquaintance Programme at Saurashtra University</b> (Contact Person: K. Asokan)
October 3-8	<b>International School on Ion Beam in Material Sciences</b> (Contact Person: D.K. Avasthi)
October 9-12	International Conference on <b>Swift Heavy Ion Material Engineering and Characterisation (SHIMEC-2012)</b> (Contact Person: D.K. Avasthi)
October 15-20	Workshop on <b>Innovative Experiments</b> (Contact Person: Ajith Kumar B.P./V.V. Satyanarayan, IUAC)
November 16	Acquaintance Programme at <b>Ranchi Central University</b> (Contact Person: A. Mandal)
November 22-23	Workshop on <b>High Performance Computing</b> (Contact Person: S. Mookherjee)
November 26	Workshop on Physics with <b>Neutron Array</b> (Contact Person: P. Sugathan)
December 11-13	School on <b>Thin Film</b> (Contact Person: D. Kabiraj)
December 17-18	<b>Users Workshop</b>
December 19	<b>Foundation Day &amp; 53rd AUC Meeting</b>

## 6.6 LIST OF PH.D AWARDEES

### Doctoral Theses

- Subhendu Ghosh** Development and operation of subsystems of superconducting heavy ion linear accelerator.
- Yogesh Kumar** Growth and properties of rare earth nickelate thin films and their swift heavy ion irradiation study.

## 6.7 LIST OF PUBLICATIONS

### A. NUCLEAR PHYSICS

- Indian National Gamma Array at IUAC**, S. Muralithar, K. Rani, R.P. Singh, R. Kumar, J.J. Das, J. Gehlot, K.S. Golda, A. Jhingan, N. Madhavan, S. Nath, P. Sugathan, T. Varughese, M. Archunan, P. Barua, A. Gupta, M. Jain, A. Kothari, B.P.A. Kumar, A.J. Malyadri, U.G. Naik, Raj Kumar, Rajesh Kumar, J. Zacharias, S. Rao, S.K. Saini, S.K. Suman, M. Kumar, E.T. Subramaniam, S. Venkataramanan, A. Dhal, G. Jnaneswari, D. Negi, M.K. Raju, T. Trivedi, R.K. Bhowmik and INGA collaboration, *Journal of Physics: Conference Series* 312 (2011) 052015.
- First observation of high spin states and isomeric decay in  $^{210}\text{Fr}$** , D. Kanjilal, S. Saha, S. Bhattacharya, A. Goswami, R. Kshetri, R. Raut, S. Muralithar, R.P. Singh, G. Mukherjee, B. Mukherjee, *Phys. Rev. C* 84 (2011) 064321.
- Structure of  $^{32}\text{P}$  at high spins**, R. Chakrabarti, S. Mukhopadhyay, R. Bhattacharjee, S.S. Ghugre, A.K. Sinha, A. Dhal, L. Chaturvedi, M. Kumar Raju, N. Madhavan, R.P. Singh, S. Muralithar, B.K. Yogi and U. Garg, *Phys. Rev. C* 84 (2011) 054325.
- Experimental study of  $\Delta I=1$  bands in  $^{111}\text{In}$** , P. Banerjee, S. Ganguly, M.K. Pradhan, H.P. Sharma, S. Muralithar, R.P. Singh, R.K. Bhowmik, *Phys. Rev. C* 83 (2011) 024316.
- Excited states in  $^{99}\text{Pd}$** , S. Sihotra, Z. Naik, S. Kumar, K. Singh, J. Goswamy, N. Singh, R. Kumar, R.P. Singh, S. Muralithar, R.K. Bhowmik, R. Palit, D. Mehta, *Phys. Rev. C* 83 (2011) 024313.
- Evaporation residue excitation function measurement for  $^{16}\text{O}+^{194}\text{Pt}$  reaction**, E. Prasad, K.M. Varier, N. Madhavan, S. Nath, J. Gehlot, Sunil Kalkal, Jhilmam Sadhukhan, G. Mohanto, P. Sugathan, A. Jhingan, B.R.S. Babu, T. Varughese, K.S. Golda, B.P. Ajith Kumar, B. Satheesh, Santanu Pal, R. Singh, A.K. Sinha and S. Kailas, *Phys. Rev. C* 84 (2011) 064606.
- HYRA gas-filled separator coupled to  $4\pi$  spin spectrometer at IUAC, New Delhi**, N. Madhavan, I. Mazumdar, T. Varughese, J. Gehlot, S. Nath, D.A. Gothe, P.B. Chavan, G. Mohanto, M.B. Naik, I. Mukul and A. K. Sinha, *EPJ Web of Conferences* 17 (2011) 14003.
- Entrance channel effect for CN  $^{200}\text{Pb}$** , Gayatri Mohanto, N. Madhavan, S. Nath, J. Gehlot, M.B. Naik, E. Prasad, Ish Mukul, T. Varughese, A. Jhingan, R.K. Bhowmik, A.K. Sinha, I. Mazumdar, D.A. Gothe, P.B. Chavan, Santanu Pal and V.S. Ramamurthy, *EPJ Web of Conferences* 17 (2011) 16007.

9. **ER cross section measurement in  $^{16}\text{O}+^{194}\text{Pt}$  reaction using gas-filled mode of HYRA**, E. Prasad, K.M. Varier, N. Madhavan, S. Nath, J. Gehlot, Sunil Kalkal, Jhilm Sadhukhan, G. Mohanto, P. Sugathan, A. Jhingan, B.R.S. Babu, T. Varughese, K.S. Golda, B.P. Ajith Kumar, B. Satheesh, Santanu Pal, R.Singh, A. K. Sinha and S. Kailas, EPJ Web of Conferences 17 (2011) 16011.
10. **Study of the effect of shell closure on the nuclear dissipation**, V. Singh, B.R. Behera, M. Kaur, D. Siwal, S. Goyal, P. Sugathan, K.S. Golda, A. Jhingan, A. Kumar, A. Saxena, R.K. Bhowmik and S. Kailas, EPJ Web of Conferences 17 (2011) 16014.
11. **Incomplete vs. Complete Fusion at  $E/A \approx 4-7$  MeV**, Pushpendra P. Singh, Abhishek Yadav, Vijay R. Sharma, Devendra P. Singh, Unnati Gupta, Manoj K. Sharma, R. Kumar, K.S. Golda, R.P. Singh, S. Muralithar, B.P. Singh, R.K. Bhowmik, R Prasad, Journal of Physics: Conference Series 282 (2011) 012019.
12. **Enhanced  $0^+_{g.s.} \rightarrow 2^+_1$  E2 Transition Strength in  $^{112,114}\text{Sn}$** , R. Kumar, P. Doornenbal, A. Jhingan, R.K. Bhowmik, S. Appannababu, P. Bednarczyk, L. Caceres, J. Cederkall, A. Ekstrom, R. Garg, J. Gerl, M. Gorska, H. Grawe, J. Kaur, I. Kojouharov, S. Mandal, S. Mukherjee, S. Muralithar, W. Prokopowicz, P.P. Singh, P. Reiter, H. Schaffner, A. Sharma, R.P. Singh, D. Siwal, H.J Wollersheim, Act. Phys. Pol. B 42 (2011) 813.
13. **Exploring the onset of quasifission by measurement of mass distribution in  $^{19}\text{F}+^{184}\text{W}$** , S. Nath, K.S. Golda, A. Jhingan, J. Gehlot, E. Prasad, Sunil Kalkal, M.B. Naik, P. Sugathan, N. Madhavan and P.V. Madhusudhana Rao, EPJ Web of Conferences 17 (2011) 16008.
14. **Observation of fission residues in the  $^{16}\text{O}+^{181}\text{Ta}$  system at  $E_{\text{lab}} \approx 6$  MeV/A**, Vijay R. Sharma, Abhishek Yadav, Pushpendra P. Singh, Devendra P. Singh, Manoj K. Sharma, Unnati, R. Kumar, B.P. Singh, R. Prasad and A.K. Sinha, EPJ Web of Conferences 17 (2011) 16012.
15. **Entrance channel effect in the incomplete fusion reactions**, Abhishek Yadav, Vijay R. Sharma, Pushpendra P. Singh, Manoj K. Sharma, Devendra P. Singh, Unnati, R. Kumar, B.P. Singh, R. Prasad and R.K. Bhowmik, EPJ Web of Conferences 17 (2011) 16019.
16. **Identification of fission-like events in the  $^{16}\text{O}+^{181}\text{Ta}$  system: Mass and isotopic yield distribution**, Vijay R. Sharma, Abhishek Yadav, Pushpendra P. Singh, Manoj K. Sharma, Devendra P. Singh, Unnati, R. Kumar, K. S. Golda, B. P. Singh, A. K. Sinha and R. Prasad, Phys. Rev. C 84 (2011) 014612.
17. **Shape evolution in odd-A  $^{137}\text{Pm}$** , A. Dhal, R.K. Sinha, D. Negi, T. Trivedi, M.K. Raju, D. Choudhury, G. Mohanto, S. Kumar, J. Gehlot, R. Kumar, S. Nath, S.S. Ghugre, R.P. Singh, J.J. Das, S. Muralithar, N. Madhavan, J.B. Gupta, A.K. Sinha, A.K. Jain, I.M. Govil, R.K. Bhowmik, S.C. Pancholi and L. Chaturvedi, Eur. Phys. J. A 48 (2012) 28.
18. **Shears mechanism in  $^{109}\text{In}$** , D. Negi, T. Trivedi, A. Dhal, S. Kumar, V. Kumar, S. Roy, M.K. Raju, S. Appannababu, G. Mohanto, J. Kaur, R.K. Sinha, D. Choudhury, D. Singh, R. Kumar, R.P. Singh, S. Muralithar, A.K. Bhati, S.C. Pancholi and R.K. Bhowmik, Phys. Rev. C 85 (2012) 057301.



19. **Emergence of principal axis rotation in  $^{110}\text{Ag}$** , S. Roy, N. Rather, P. Datta, S. Chattopadhyay, R.A. Bark, S. Pal, S. Bhattacharya, R.K. Bhowmik, A. Goswami, H.C. Jain, R. Kumar, E. Lawrie, S. Muralithar, D. Negi, R. Palit and R.P. Singh, Phys. Lett. B 710 (2012) 587.
20. **Large influence of incomplete fusion in  $^{12}\text{C}+^{159}\text{Tb}$  at Elab  $\approx$  4-7 MeV/nucleon**, A. Yadav, V.R. Sharma, P.P. Singh, D.P. Singh, M.K. Sharma, U. Gupta, R. Kumar, B.P. Singh, R. Prasad and R.K. Bhowmik, Phys. Rev. C 85 (2012) 034614.
21. **Measurements and coupled reaction channels analysis of one- and two-proton transfer reactions for the  $^{28}\text{Si}+^{90,94}\text{Zr}$  systems**, S. Kalkal, S. Mandal, A. Jhingan, J. Gehlot, P. Sugathan, K.S. Golda, N. Madhavan, R. Garg, S. Goyal, G. Mohanto, R. Sandal, S. Chakraborty, S. Verma, B. Behera, G. Eleonora, H.J. Wollersheim and R. Singh, Phys. Rev. C 85 (2012) 034606.
22. **Effect of entrance-channel parameters on incomplete fusion reactions**, Abhishek Yadav, Vijay R. Sharma, Pushpendra P. Singh, Devendra P. Singh, R. Kumar, Unnati, M. K. Sharma, B. P. Singh, R. Prasad and R. K. Bhowmik, Phys. Rev. C 85 (2012) 064617.

## B. MATERIALS SCIENCE

1. **Evolution and tailoring of plasmonic properties in  $\text{Ag:ZrO}_2$  nanocomposite films by swift heavy ion irradiation**, Manish Kumar, P. K. Kulriya, J. C. Pivin, and D. K. Avasthi, Journal of Applied Physics 109, 044311 (2011)
2. **125 MeV  $\text{Si}^{9+}$  ion irradiation on calcium phosphate thin film coated by rf-magnetron sputtering technique**, K. Elayaraja, M. I. Ahymah Joshy, R. V. Suganthi, S. N. Kalkura, M. Palanichamy, M. Ashok, V. V. Siva Kumar, P. K. Kulriya, I. Sulania, D. Kanjilal and K. Asokan. Applied Surface Science, Vol 257 ( 2011 ) 2134 – 2141.
3. **Effect of swift heavy ion irradiation on structural, optical and electrical properties of spray deposited CdO thin films**; R. Kumaravel, K. Ramamurthi, Indra Sulania, K. Asokan, D. Kanjilal, D.K. Avasthi and P.K. Kulriya, Radiation Physics and Chemistry Volume 80, Issue 3, March 2011, Pages 435-439
4. **Synthesis of Au nanoparticles at the surface and embedded in carbonaceous matrix by 150 keV Ar ion irradiation**, Jai Prakash, A. Tripathi, V. Riato, J. C. Pivin, Jalaj Tripathi, Keun Hwa Chae, Sanjeev Gautam, P. Kumar, K. Asokan, D. K. Avasthi, J. Phys. D: Applied Physics 44 (2011) 125302.
5. **Study on synthesis of magnetic nanocomposite (Ni-Teflon) by swift heavy ion beam mixing**, Jai Prakash, A. Tripathi, J. C. Pivin, Jalaj Tripathi, A. K. Chawla, R. Chandra, S. S. Kim, K. Asokan, D. K. Avasthi, Adv. Mat. Lett. 2 (2011) 71
6. **Investigation of swift heavy ion induced mixing in metal polymer systems**, Jai Prakash, A. Tripathi, S. A. Khan, J. Tripathi, Fouran Singh, S. Kumar, J. K. Tripathi. Rad. Eff. Def. in solids 166 (2011) 682.

7. **Observation of size dependent attributes on the magnetic resonance in irradiated zinc ferrite nanoparticles;** Jitendra Pal Singh, R. C. Srivastava, H. M. Agrawal, Prem Chand, and Ravi Kumar, *Current Applied Physics* 11 (2011) 532-537.
8. **Study of 200 MeV Ag<sup>15+</sup> ion induced amorphisation in nickel ferrite thin films,** Gagan Dixit, Jitendra Pal Singh, R.C.Srivastava and H.M.Agrawal, *Nucl. Instr. Meth. Phys. Res. B*, 269 (2011) 133-139.
9. **Defect Engineering in GaAs Using High Energy Light Ion Irradiation: Role of Electronic Energy Loss,** D. Kabiraj, Subhasis Ghosh. *J. Appl. Phys.* 109 (2011) 033701
10. **Nanophotonics for 21st Century,** S. K. Ghoshal, M. R. Sahar, M. S. Rohani and Sunita Sharma, Accepted in *Intech*, Ed. P.Predeep (2011)
11.  **$\mu$ -Raman investigation of nanosized zinc ferrite: effect of crystallite size and fluence of irradiation;** Jitendra Pal Singh, R. C. Srivastava, H. M. Agrawal and Ravi Kumar, *J. Raman Spect.* DOI 10.1002/jrs.2902
12. **100 MeV O<sup>7+</sup> ion irradiation in nanosize zinc ferrite,** Jitendra Pal Singh, R. C. Srivastava, H. M. Agrawal, Prem Chand and Ravi Kumar *Rad. Effects and Defects in Solids.* DOI: 10.1080/10420150.2011.553233
13. **Study of optical, structural and chemical properties of neutron irradiated PADC film,** V. Kumar, R.G. Sonkawade, S. K. Chakarvarti, P K Kulriya, K. Kant, K., N. L. Singh, A.S. Dhaliwal, *Vacuum*, (2011).
14. **Effect of sol-age on the surface and optical properties of sol-gel derived mesoporous zirconia thin films,** Manish Kumar and G.B. Reddy, *AIP Advances* 1 (2011) 022111.
15. **Engineering of hydrophilic and plasmonic properties of Ag thin film by atom beam irradiation,** U.B. Singh, D.C. Agarwal, S.A. Khan, Manish Kumar, A. Tripathi, R. Singhal, B.K. Panigrahi, D.K. Avasthi, *Applied Surface Science* 258 (2011) 1464-1469
16. **Swift heavy ion interaction with silver–silica nanocomposites: an experimental surface plasmon resonance study,** Fouran Singh, J. C. Pivin, Doriana Dimova-Malisenovska, and J. P. Stoquert, *J. Phys. D: Appl. Phys.*, 44 (2011) 325101.
17. **Softening of phonons by lattice defects and structural strain in heavy ion irradiated nanocrystalline zinc oxide films,** Fouran Singh, R. G. Singh, Vinod Kumar, S. A. Khan, and J. C. Pivin, *J. Appl. Phys.* 110 (2011) 083520.
18. **Structural and spectroscopic modifications of nanocrystalline zinc oxide films induced by swift heavy ions,** Sebiha Rehman, R. G. Singh, J. C. Pivin, Waseem Bari, Fouran Singh, *Vacuum*, 86 (2011) 87.

19. **Synthesis of nanocrystalline  $\alpha$ -Zn<sub>2</sub>SiO<sub>4</sub> at ZnO-porous silicon interface: Phase transition study**, R. G. Singh, Fouran Singh, R. M. Mehra, D. Kanjilal and V; Agarwal Solid State Communications 151 (2011) 701.
20. **Growth kinetics of ZnO nanocrystallites: Structural, optical and photoluminescence properties tuned by thermal annealing**, R. G. Singh, Fouran Singh, Vinod Kumar, R.M. Mehra, Current Applied Physics 11 (2011) 624.
21. **Ionoluminescence studies of combustion synthesized Dy<sup>3+</sup> doped nanocrystalline forsterite**, B.N. Lakshminarasappa, S.C. Prashantha, Fouran Singh, Current Applied Physics, 11 (2011) 1274.
22. **Luminescence studies on swift heavy ion irradiated nanocrystalline aluminum oxide**, **K.R. Nagabhushana**, B.N. Lakshminarasappa, D. Revannasiddaiah, Fouran Singh, Journal of Luminescence, 131 (2011) 764.
23. **Enhancement of LPG sensing properties in nanocrystalline zinc oxide thin film by high electronic excitation**, Ravikiran B. Birajadar, Arindam Ghosh, Anil Ghule, Fouran Singh, and Ramphal Sharma, Sensors and Actuators B, 160 (2011) 1050.
24. **Optical absorption and Thermoluminescence studies on 100 MeV swift heavy ion irradiated CaF<sub>2</sub> crystals**, C. Pandurangappa, B.N. Lakshminarasappa, Fouran Singh, and K. R. Nagabhushana, Nucl. Instrum and Method B 269 (2011) 185.
25. **Effect of ion beam irradiation on metal particle doped polymer composites**, N.L. Singh, S. Shah, A. Qureshi, A. Tripathi, Fouran Singh, D.K. Avasthi and P.M. Raole, Bulletin of Materials Science, 34 (2011) 81.
26. **The effect of SHI irradiation on structural, thermal and dielectric properties of a silver nanoparticle-embedded polystyrene matrix**, C. Gavade, N.L. Singh, A. Sharma, P.K. Khanna and Fouran Singh, Radiation Effects and defects in Solids, 166 (2011) 585.
27. **Band gap controlled H loss from passivated Hg<sub>1-x</sub>Cd<sub>x</sub>Te (MCT) wafers under intense electronic excitations**, Anjali, S. Ghosh, P. Srivastava, S.A. Khan, A.P. Pathak, Nucl Instrum Meth B 269 (2011) 1016.
28. **Memristive switching induced by 100 MeV Ag<sup>7+</sup> ion irradiation in Ag/La<sub>0.75</sub>Sr<sub>0.3</sub>MnO<sub>3</sub>/Ag planar structures**, K.H. Bhavsar, U.S. Joshi, B.V. Mistry, S.A. Khan, D.K. Avasthi, Radiat. Eff. Defects Solids 166 (2011) 718.
29. **Nano/micro-structuring of oxide thin film under SHI irradiation**, R.S. Chauhan, D.C. Agarwal, S. Kumar, S.A. Khan, D. Kabiraj, I. Sulania, D.K. Avasthi, W. Bolse, Vacuum 86 (2011) 96.
30. **Role of melting temperature in intermixing of miscible metal/metal bilayers induced by swift heavy ions**, A. Gupta, R.S. Chauhan, D.C. Agarwal, S. Kumar, S.A. Khan, S. Mohapatra, A. Tripathi, T. Som, Radiat. Eff. Defects Solids 166 (2011) 689.

31. **The effects of Ni and Mg<sub>2</sub>Ni interlayer on hydrogenation properties of Pd sandwiched Mg films**, P. Jain, A. Jain, D. Vyas, R. Verma, S.A. Khan, I.P. Jain, J. Alloys Compd. 509 (2011) 2105.
32. **Quasi-aligned gold nanodots on a nanorippled silica surface: experimental and atomistic simulation investigations**, S.A. Khan, D.K. Avasthi, D.C. Agarwal, U.B. Singh, D. Kabiraj, Nanotechnology 22 (2011) 235305.
33. **Atomistic simulations of Au-silica nanocomposite film growth**, S.A. Khan, K.H. Heinig, D.K. Avasthi, J. Appl. Phys. 109 (2011) 094312.
34. **Nano Pattern on n-Si (100) Surface by Ion Irradiation**, T. Kumar, S.A. Khan, U.B. Singh, S. Verma, D. Kanjilal, AIP Conf. Proc. 1349 (2011) 727.
35. **Sputtering of CaF<sub>2</sub> Thin Films**, R.K. Pandey, S.A. Khan, D.K. Avasthi, A.C. Pandey, AIP Conf. Proc. 1349 (2011) 651.
36. **Structural phase diagram for ZnS nanocrystalline thin films under swift heavy ion irradiation**, S.P. Patel, S.A. Khan, A.K. Chawla, R. Chandra, J.C. Pivin, D. Kanjilal, L. Kumar, Physica B-Condensed Matter 406 (2011) 4150.
37. **Spectral studies on Ag<sup>8+</sup> ions irradiated LAHCl.H<sub>2</sub>O and LAHBr.H<sub>2</sub>O single crystals**, K. Sangeetha, R.R. Babu, K. Ramamurthi, J. Prakash, S.A. Khan, Spectrochimica Acta Part a-Molecular and Biomolecular Spectroscopy 79 (2011) 884.
38. **Strain modification of AlGaIn layers using swift heavy ions**, N. Sathish, A.P. Pathak, S. Dhamodaran, B. Sundaravel, K.G.M. Nair, S.A. Khan, D.K. Avasthi, M. Bazzan, E. Trave, P. Mazzoldi, Radiat. Eff. Defects Solids 166 (2011) 843.
39. **Creation of self-organized gold nanostructures by keV ion beam irradiation**, U.B. Singh, D.C. Agarwal, S.A. Khan, A. Tripathi, A. Kumar, R.K. Choudhury, B.K. Panigrahi, D.K. Avasthi, Radiat. Eff. Defects Solids 166 (2011) 553.
40. **Effect of thermal spike energy created in CuFe<sub>2</sub>O<sub>4</sub> by 150 MeV Ni<sup>11+</sup> swift heavy ion irradiation**, M. Balaji, M. Manivel Raja, K. Asokan, D. Kanjilal, T.R. Rajasekaran, D. Pathinettam Padiyan, Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 269 (2011) 1088.
41. **Effects of O<sup>7+</sup> swift heavy ion irradiation on indium oxide thin films**, V. Gokulakrishnan, S. Parthiban, E. Elangovan, K. Ramamurthi, K. Jeganathan, D. Kanjilal, K. Asokan, R. Martins, E. Fortunato, Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 269 (2011) 1836.
42. **Effect of 100 MeV Ni<sup>9+</sup> ion irradiation on MOCVD grown n-GaN**, V. Suresh Kumar, J. Kumar, P. Puviarasu, S. Munawar Basha, D. Kanjilal, K. Asokan, Physica B: Condensed Matter, 406(2011)4210.

43. **Influence of 150 MeV Ni<sup>11+</sup> swift heavy ion irradiation on CuFe<sub>2</sub>O<sub>4</sub> thin films prepared by radio frequency magnetron sputtering: Modification on structure and surface morphology**, M. Balaji, K. Asokan, D. Kanjilal, C. Sanjeeviraja, T.R. Rajasekaran, D. Pathinettam Padiyan, Thin Solid Films, 520(2011)204.
44. **Ion irradiation induced modifications of nanostructured Ni–Mn–Sn ferromagnetic shape memory alloy thin films**, R. Vishnoi, R. Singhal, K. Asokan, D. Kanjilal, D. Kaur, Thin Solid Films, 520 (2011)1631
45. **Efficient performance of electrostatic-spray deposited TiO<sub>2</sub> blocking layer in dye-sensitized solar cells by swift heavy ion beam irradiation**, P Sudhagar; K Asokan; June Hyuk Jung; Yong-Gun Lee; Suil Park; Yong Soo Kang, Nanoscale Research Letters. 6(2011)30.
46. **Looking for the possibility of multiferroism in NiGd<sub>0.04</sub>Fe<sub>1.96</sub>O<sub>4</sub> nanoparticle system**, Singh, J.P. Dixit, G., Srivastava, R.C., Agrawal, H.M., Asokan, K. Journal of Physics D: Applied Physics, 44 (2011)435306
47. **Role of 3d electrons in the rapid suppression of superconductivity in the dilute V doped spinel superconductor LiTi<sub>2</sub>O<sub>4</sub>** Chen, C.L., Chang, C.L., Wu, M.K., Dong, C.L., Asokan, K., Chen, J.L., Liu, Y.S., Hsu, F.C. Superconductor Science and Technology, 24 (2011) 115007
48. **The effect of Ag<sup>16+</sup> ion irradiation on the structural properties of Ba-W hexaferrite prepared using a co-precipitation route**, Panchal, N.R., Asokan, K., Jotania, R.B. Radiation Effects and Defects in Solids, 166 (2011)653.
49. **Local atomic and electronic structures and ferroelectric properties of PbZr<sub>0.52</sub>Ti<sub>0.48</sub>O<sub>3</sub>: An x-ray absorption study**, Ray, S.C., Chiou, J.W., Tsai, M.-H., Lee, J.M., Jang, L.Y., Chen, J.M., Lee, J.F., Pong, W.F. Applied Physics Letters, 99 (2011)042909 .
50. **Effect of Li<sup>3+</sup> heavy ion irradiation on the Mo doped In<sub>2</sub>O<sub>3</sub> thin films prepared by spray pyrolysis techniques**, Parthiban, S., Elangovan, E., Ramamurthi, K., Kanjilal, D., Asokan, K., Martins, R., Fortunato, E. Journal of Physics D: Applied Physics, 44 (2011), 085404.
51. **Growth kinetics of nanograins in SnO<sub>2</sub> fibers and size dependent sensing properties**, Park, J.Y., Asokan, K., Choi, S.-W., Kim, S.S. Sensors and Actuators, B: Chemical, 152 (2011) 254.
52. **Structural, optical and electrical characteristics of 70 MeV Si<sup>5+</sup> ion irradiation-induced nanoclusters of gallium nitride**, Suresh, S., Ganesh, V., Deshpande, U.P., Shripathi, T., Asokan, K., Kanjilal, D., Baskar, K. Journal of Materials Science, 46 (2011)1015.
53. **Electronic structure studies of nanoferrite Cu<sub>x</sub>Co<sub>1-x</sub>Fe<sub>2</sub>O<sub>4</sub> by X-ray absorption spectroscopy**, S. Gautam, S. Muthurani, M. Balaji, P. Thakur, D.P. Padiyan, K.H.Chae, S.S. Kim, K. Asokan. Journal of Nanoscience and Nanotechnology, 11 (2011)386.
54. **Formation of nano dots on GaAs by 50 keV Ar<sup>+</sup> ion irradiation**, Tanuj Kumar, S. A. Khan, U. B. Singh, S. Verma and D. Kanjilal, Applied Surface Science 258 (2011) 4148–4151

**C. OTHERS**

1. **Charge state distribution studies of SrF<sub>3</sub>, MnF<sub>3</sub> and CaF<sub>3</sub> molecules using single and double stripping in a Tandem accelerator**, Pankaj Kumar, G. Korschinek, S. Chopra, T. Faestermann, P. Ludwig, G. Rugel, D. Seiler, A. Wallner, S. Ojha, S. Gargari, R. Joshi, D. Kanjilal, Nuclear Instrumentation and Methods in Physics research B 269 (2011), 1986-1991
2. **Search for super heavy elements with  $292 \leq A \leq 310$  in nature with accelerator mass spectrometry**, P. Ludwig et.al, T. Faestermann, G. Korschinek, G. Rugel, I. Dillmann, L. Fimiani, S. Bishop and Pankaj Kumar Phys. Rev. C 85, 024315 (2012)
3. **<sup>10</sup>Be measurements at IUAC-AMS facility**, Pankaj Kumar, J.K Pattanaik, S. Ojha, S. Gargari, R. Joshi, G.S. Roonwal, S. Balakrishnan, S. Chopra and D. Kanjilal, J Radioanal Nucl Chem.(2011) DOI 10.1007/s10967-011-1184-x
4. **<sup>10</sup>Be as Palaeoclimate tracer: Initial results from South Western Indian Ocean**, N Khare, P. Govil, Pankaj Kumar, A. Mazumder, S. Chopra, J. K. Pattanaik, S. Balakrishnan and G. S. Roonwal, J Radioanal Nucl Chem. (2011), DOI 10.1007/s 10967-011-1218-4
5. **Accelerator Mass Spectrometry to understand hot vents history and precipitation of sea floor sulfides**, G.S. Roonwal, Pankaj Kumar, S. Chopra, Inter Ridge News Vol. 20 (2011) Page 27-29
6. **AMS and associated facilities at IUAC, New Delhi, India**, Pankaj Kumar, Pattanaik J. K., Archana Bohra, Ojha S., Gargari S., Joshi R., Balakrishnan S., Chopra S. Invited talk at ISMAS International Discussion Meet on Elemental Mass Spectrometry in Health and Environmental Sciences 2011 held at IUAC, New Delhi April 14-15, 2011, (Proceedings book page no. 61-63, ISBN 978-81-904442-3-1)
7. **Extraction of Be and Al from Geological Samples for AMS Measurement**, Pattanaik J. K., Balakrishnan S., Pankaj Kumar, Chopra S. Invited talk at ISMAS International Discussion Meet on Elemental Mass Spectrometry in Health and Environmental Sciences 2011 held at IUAC, New Delhi April 14-15, 2011, (Proceedings book page no. 79-83, ISBN 978-81-904442-3-1)
8. **Activation of DNA damage response signaling in lung adenocarcinoma A549 cells following oxygen beam irradiation**. Ghosh S, Narang H, Sarma A, Kaur H, Krishna M, Mutation Research, 2011 Aug 16;723(2):190-8. Epub 2011 May 14.
9. **DNA damage response signaling in lung adenocarcinoma A549 cells following gamma and carbon beam irradiation**, Ghosh S, Narang H, Sarma A, Krishna M. Mutat Res. 2011 Nov 1; 716(1-2):10-9. Epub 2011 Aug 3.
10. **PRAMANA-Journal of Physics**, Design of a Super conducting Low Beta Resorater.
11. **Phys. Rev. ST Accelerators & Beams**, Super conducting properties of Niobium after electron beam welding.

**6.8 LIST OF SEMINARS CONDUCTED IN THE YEAR – 2011-12**

S.No.	Date	Title	Name
1.	05/04/11	Translating bench research to solve cancer survivors bone health problem through a interdisciplinary approach	Dr. S.K. Hui, University of Minnesota, USA
2.	09/05/11	Highly effieicent dye-sensitized solar cells	Prof. Liyan Han, National Instt. For Materials Science, Tsukuba, Japan
3	11/07/11	Magnetization Dynamics at High Frequencies, Ferromagnetics Resonance	Ms. Elisa Papa, Institute of Condensed Matter Physics Ecole polytechnic fedrale de lausanne Switzerland
4.	11/07/11	Atomic and Molecular Rydbergs from water	Dr. Jyoti Rajput, Delhi University
5.	04/08/11	Synchrotron Radiation in Magnetic X-ray Scattering Studies	Dr. D.K. Shukla, Deutsches Elektronen-Synchrotron (DESY), Notkestrasse 85, Hamburg 22603, Germany
6.	08/08/11	Ion Sources for Neutron Rich RIB Production at ORNL	Dr. J.J. Das, Oak Ridge National Lab, USA
7.	26/08/11	Intermediate Mass Fragments Emission and ISO-scaling in Ca+Sn Reactions at 45A MeV	Dr. Hardev Singh, DOP, University of Rochester, NY, USA
8.	13/09/11	Beam Driven Instabilities in a magnetized beam plasma system	Prof. V.K. Tripathi, IIT Delhi.
9.	11/10/11	Search for charged Lepton Flavor Violation with Muons at J-PARC	Prof. Y. Kuno, Osaka University, Japan
10.	14/10/11	Theory of Nanoscale Patterns Produced by Ion Bombardment	Prof. R. Mark Bradley, Colorado State University, USA
11.	20/10/11	Experiments on Surface Treatment of Nb at KEK	Dr. Puneet Veer Tyagi KEK, Japan
12.	24/10/11	Synergetic effect between nuclear and electronic energy loss on the sputtering of Ti and in track formation in crystalline and amorphous SiO <sub>2</sub>	Prof. Marcel Toulemonde, CIMAP, Caen, France
13.	31/10/11	Pursuing Basic Research: Issues of Ethics and Plagiarism	Dr. D.K. Srivastava, VECC, Kolkata

S.No.	Date	Title	Name
14.	02/11/11	Photoexcitation of Hollow Helium, Hollow Lithium and Hollow Beryllium with Synchrontron Radiation	Prof. Yoshiro AZUMA, Sophia University, Japan
15.	14/11/11	Powering of next generation of Collide Physics Detectors	Dr. Satish Dhawan, Yale University, USA
16.	05/11/11	The Dynamic Sun: X-Ray Spectroscopy of Solar Corona	Prof. Rajmal Jain, Physical Research Laboratory, Ahmedabad
17.	28/11/11	From Outer Space to Inner Space- Imaging with Cosmic Rays	Mr. Bhaskar Sur, Atomic Energy of Canada Limited, Chalk River National Laboratories, Canada.
18.	14/12/11	Basic Research on induced depletion of Nuclear Isomers	Prof. James J. Carrol, US Army Research Laboratory, Adelphi, Maryland, USA
19.	20/12/11	Total marrow irradiation: an emerging area orf interdisciplinary and translational research of hematological	Dr. Susanta K. Hui, University of Minnesota, Minneapolis, USA
20.	23/01/12	Challenges in Research	Dr. Tapan nandi, IUAC
21.	14/02/12	Where do we stand in Research on Nanocomposites at IUAC	Dr. Fouran Singh, IUAC
22.	27/02/12	Measurement of $^{93}\text{Zr}$ by AMS and its application	Ms. Karin Hain, Physics Deptt. Technical Univ. Munich, Germany
23.	02/03/12	Photon and laser beam Nano-patterning A pathway for bio-sensing and nano-spectroscopy	Dr. Pratap K. Sahoo, NISER, Bhubneswar
24.	23/03/12	Conic Section and lawa of physics	Prof. Rabin Bannerjee, S.N. Bose National Centre for Basic Sciences, Kolkata
25.	26/03/12	Ion Transmission Through Insulating Capillaries	Dr. A Cassimi, CIMAP, CAEN< France
26.	29/03/12	Beam-Foil Spectroscopy of Doubly-excited States in Atoms: Some Past History and Some Future IUAC Research	Prof. Gorden Berry, Physics Department, University of Notre Dame, Notre Dame, US.



## 6.9 LIST OF TECHNICAL REPORTS / TECHNICAL MEMOS (2011-12)

### A. LIST OF TECHNICAL REPORTS

Sl.	Title	Authors	Category	Reference No.
1	ACS Detector Bias Power Supply (3 KV, 10 mA)	S.K.Suman, Rajesh Kumar, Mukesh Kumar, A Mandal, S Murlithar, R.K. Bhowmick	Instrumentation	IUAC/TR/ SKS/2011-12/01
2	Germanium Detector Bias Supply with Output Ramp Facility	Rajesh Kumar, S.K.Suman, Mukesh Kumar, A. Mandal, S. Murlithar, R.K. Bhowmick	Instrumentation	IUAC/TR/ RJK/2011-12/02
3	Controller For Spark Counter and Beta Ray Spectrometer	S.K.Suman, Rajesh Kumar, A. Mandal	Instrumentation	IUAC/TR/ SKS/2011-12/03
4	Multi Output Portable Power Supply	S.K.Suman, Rajesh Kumar, A. Mandal	Instrumentation Instrumentation	IUAC/TR/ SKS/2011-12/04
5	Traveling Wave Tube Amplifier For LEIBF	Yaduvansh Mathur, U.K.Rao, G.O. Rodrigues	Civil	IUAC/TR/ SKS/2011-12/05
6	Design of MS platform at midheight level in workshop area in Engg. Bldg. For houseing 50KeV ion Accelerator Lab.	M.K. Gupta	Civil	IUAC/TR/ MKG/2011-12/06
7	Problems of seepage and dampness in old buildings	M.K. Gupta	Accelerator	IUAC/TR/ MKG/2011-12/07
8	Microphonics measurement of superconducting resonators in second Linac cryostat module and effect of electronic damping for reduction of microphonics	B.K.Sahu, A.Rai, P.Patra, A. Pandey, G.K. Chaudhary, D.S. Mathuria, R.N. Dutt, S. Ghosh, G. Joshi, D Kanjilal, A. Roy	Technology	IUAC/TR / BKS/2011-12/08

<b>Sl.</b>	<b>Title</b>	<b>Authors</b>	<b>Category</b>	<b>Reference No.</b>
9	Successful Beam Acceleration through First and Second Linac Module	J. Karmakar, S Ghosh, R.Mehta, GKChowdhary, A Rai, P.Patra, B.k.Sahu, A. Pandey, R.N. Dutt, D.S.Mathuria, J.Chacko, A.Chowdhary, S.Kar, S.Babu, Manoj Kr., SSSK. Sonti, KK.Mistri, J.Antony, J.Zacharias, A. Sarkar, R.Joshi, P.N.Prakash, TS.Datta, D.Kanjilal, and A.Roy	Accelerator	IUAC/TR/ JK/2011-12/09
10	Mechanical Design and Fabrication of Vanes and Vane Posts for Prototype RFQ	R.Ahuja, A.Kothari, Sugam Kr., CP Safvan		IUAC/TR/ RA/2011-12/10
11	PLC Based Safety & HV Area Monitoring System for LEIBF	Raj Kumar	Electrical Group	IUAC/TR/ RK/2011-12/11
12	Design Validation of Prototype DTL Resonator and RF High Power Test Analysis	R.V. Hariwal, R. Mehta, J.Zachiriah, Rajesh Kumar, Y. Mathur, U.K. Rao and Ajith B.P.	Drift Tube Linac Lab	IUAC/TR/ RVH/2011-12/12
13	Beam Optics of HEBT section of HCI	Sarvesh Kumar, A Mandal	Beam Transport Lab	IUAC/TR/ SK/2011-12/13
14	Ion Optical Design of 48.5MHz Spiral bunchers for HCI	Sarvesh Kumar, A Mandal	Beam Transport Lab	IUAC/TR/ SK/2011-12/14
15	Annealing of HPGe-Detector	R.K. Gurjar, R. Kumar and S Muralithar	Instrument & Maintenance	IUAC/TR/ RKG/2011-12/15

**B. LIST OF TECHNICAL MEMOS**

<b>Sl.</b>	<b>Title</b>	<b>Authors</b>	<b>Category</b>	<b>Reference No.</b>
1	Klystron Power Generator Power Saturation Problem	Yaduvansh Mathur and G.O. Rodrigues	Instrumentation	IUAC/TM/ TM/2011-2012/01
2	Communication Failure Problem in TWT Amplifier	Yaduvansh Mathur, U.K.Rao, G.O. Rodrigues	Instrumentation	IUAC/TM/ YM/2011-2012/02
3	Trouble Shooting of Microwave Power Generator For PKDELIS	Yaduvansh Mathur, U.K.Rao, G.O. Rodrigues	Instrumentation	IUAC/TM/ YM/2011-2012/03
4	Technical memo on Quarter wave power combiners	Parmanand Singh, S Venkatramanan	Instrumentation	IUAC/TM/ PMS/2011-12/04
5	Repairing of gamma area monitors	Birendra Singh, S.P.Lochab, Rajan Joshi	Instrumentation	IUAC/TM/ BS/2011-2012/05
6	Repairing of TLD Reader	Birendra Singh, S.P.Lochab, Rajan Joshi	Instrumentation	IUAC/TM/ BS/2011-2012/06
7	Voltage Controlled RF Attenuator	Paramanand Singh, S. Venkatramanan	Instrumentation	IUAC/TM/ PNS/2011-12/07